IRRIGATION UNDER THE PROVISIONS OF THE CAREY ACT

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THE LAW MET AN EXISTING NEED.

THE FIRST DESERT LAND reclaimed by irrigation in this country was so situated that the water supply could be provided at small cost. Usually it was only necessary to construct a cheap diversion dam of brush or stone and excavate a canal and distributaries to conduct the water to the land to be irrigated. Such an undertaking required little capital and could be built by a single farmer or by a group of farmers cooperating.

After a time practically all land which could be reclaimed cheaply was brought under irrigation and the construction of irrigation systems became increasingly difficult and costly. It then became apparent that the homestead and desert-land laws alone were not applicable to the reclamation of land in large units, since under those laws the landowner was not compelled to purchase a water right from the company which constructed the irrigation works intended to reclaim his holding. A law was needed which would offer reasonable assurance to the construction company that the settlers who filed on the land to be served by the canal system would pay a just proportion of the cost of providing the water supply and at the same time provide for the transfer of title to the land from the Government to the settler when the land had been reclaimed.

Accordingly, in 1894, a law known as the Carey Act (act of Aug. 18, 1894, 28 Stat., 422) was passed, which authorized the Secretary of the Interior to patent land to States in which desert lands were found, provided the State would cause such land to be reclaimed and irrigated. The full text of the act is given below:

That to aid the public land States in the reclamation of the desert land therein, and the settlement, cultivation, and sale thereof in small tracts to actual settlers, the Secretary of the Interior, with the approval of the President, be, and hereby is, authorized and empowered, upon proper application of the State, to contract and agree, from time to time, with each of the States in which there may be situated desert lands as defined by the act entitled "An act to provide for the sale of desert land in certain States and Territories," approved March third, eighteen hundred and ninety-one, binding the United States to donate, grant, and patent to the State free of cost for survey or price such desert lands, not exceeding one million acres in each State, as the State may cause to be irrigated, reclaimed, occupied, and not less than twenty acres of each one hundred and sixty-acre tract cultivated by actual settlers, within ten years next after the passage of this act, as thoroughly as is required of citizens who may enter under the said desert-land law.

Before the application of any State is allowed or any contract or agreement is executed or any segregation of any of the land from the public domain is ordered by the Secretary of the Interior, the State shall file a map of the said land proposed to be irrigated, which shall exhibit a plan showing the mode of the contemplated irrigation and which plan shall be sufficient to thoroughly irrigate and reclaim said land and prepare it to raise ordinary agricultural crops, and shall also show the source of the water to be used for irrigation and reclamation, and the Secretary of the Interior may make necessary regulations for the reservation of the lands applied for by the States to date from the date of the filing of the map and plan of irrigation, but such reservation shall be of no force whatever if such map and plan of irrigation shall not be approved. That any State contracting under this section is hereby authorized to make all necessary contracts to cause the said lands to be reclaimed, and to induce their settlement and cultivation in accordance with and subject to the provisions of this section; but the State shall not be authorized to lease any of said lands or to use or dispose of the same in any way whatever, except to secure their reclamation, cultivation, and settlement.

As fast as any State may furnish satisfactory proof, according to such rules and regulations as may be prescribed by the Secretary of the Interior, that any of said lands are irrigated, reclaimed, and occupied by actual settlers, patents shall be issued to the State or its assigns for said land so reclaimed and settled: *Provided*, That said States shall not sell or dispose of more than one hundred and sixty acres of said land to any one person, and any surplus of money derived by any State from the sale of said lands in excess of the cost of their reclamation, shall be held as a trust fund for and be applied to the reclamation of other desert lands in such State. That to enable the Secretary of the Interior to examine any of the lands that may be selected under the provisions of this section, there is hereby appropriated out of any moneys in the Treasury not otherwise appropriated, one thousand dollars.

There were two important defects in the original act which later were corrected by amendments. The first of these was that while the State was "authorized to make all necessary contracts to cause the land to be reclaimed and to induce settlement and cultivation," it was not afforded any protection in the assumption of this responsibility, nor could it protect the company which constructed the works, since patent to the land would not be issued prior to actual operation of the system and partial cultivation of the land. To overcome this objection an amendment was passed (act of June 11, 1896; 29 Stat., 434) which provided that:

A lien or liens is hereby authorized to be created by the State to which such lands are granted, and by no other authority whatever, and when created shall be valid on and against the separate legal subdivisions of land reclaimed for the actual cost and necessary expenses of reclamation and reasonable interest thereon from the date of reclamation until disposed of to actual settlers; and when an ample supply of water is actually furnished in a substantial ditch or canal, or by artesian wells or reservoirs, to reclaim a particular tract or tracts of such land, then patents shall issue for the same to such State without regard to settlement or cultivation: *Provided*, That in no event, in no contingency, and under no circumstances shall the United States be in any manner, directly or indirectly, liable for any amount of any such lien or liability, in whole or in part.

The other defect was the time limit of 10 years within which reclamation had to be accomplished. This made the planning and construction of projects of any considerable magnitude inadvisable, since the act itself expired in 10 years from the date of its passage. This fault was corrected by an amendment (act of Mar. 3, 1901; 31 Stat., 1188) which provided that the 10-year period should begin to run from the date on which the Secretary of the Interior approved the State's application for the segregation, and that the Secretary of the Interior had authority, in his discretion, either to restore the land to the public domain at the end of this period or to continue the segregation for a period of not to exceed five years.

DEVELOPMENT UNDER THE CAREY ACT.

The following States have accepted the terms of the Carey Act in the order of the date of acceptance: Wyoming, Montana, Idaho, Colorado, Oregon, Nevada, Washington, Utah, Arizona, and New Mexico. In only the first five of these has any actual reclamation taken place under the act. The following table contains data regarding the development which has taken place under the various projects in these States. Only such projects are included in the table as have reached the stage where actual reclamation has taken place. The figures in the column giving the acreage irrigated in 1917 are based, in most cases, on estimates made by officials of the respective companies.

Development under the Carey Act.

Name of project.	Area in project.	Area irrigated 1917.	Per cent of total area reclaimed.	Source of water supply	Special features.
Idaho:	*Acres.*	*Acres.*			
Twin Falls Canal Co.	200,000	180,000	87.3	Snake River	
Twin Falls N. Side Land & Water Co.	200,000	85,000	42.5	do	Storage in Jackson Lake, Wyo.
Idaho Irrigation Co.	112,000	43,700	39.0	Wood River	Storage reservoir.
Big Lost River (Utah Construction Co.)[1]	80,000	1,000	1.3	Big Lost River	Do.
Aberdeen-Springfield Canal Co.	65,000	26,000	40.0	Snake River	
Twin Falls Salmon River Land & Water Co.	45,000	44,700	99.2	Salmon River	Do.
Owsley Irrigation Co.	30,000	3,000	10.0	Mud Lake	Pumping plants.
Twin Falls Oakley Land & Water Co.	28,000	23,000	82.1	Several creeks	Storage reservoir.
Emmett Irrigation District.	22,000	8,000	36.3	Payette River	Tunnel and steel flumes.
King Hill Project[2]	21,000	6,000	28.5	Snake River	Wood-pipe siphons and flumes.
Portneuf-Marsh Valley Irrigation Co.	12,000	7,000	58.3	Portneuf River	Reservoir and flumes.
Marysville Canal & Improvement Co.	12,000	12,000	100.0	Fall River	
Keating Carey Land Co.	9,000	(?)			Storage reservoir.
Blaine County Irrig. Co.	8,000	6,500	80.1	Little Lost River	Do.
Snake River Irrigation Co.	8,000	5,500	68.7	Snake River	Pumping plants.
Pratt Irrigation Co.	4,500	2,600	60.0	Giant Springs	Storage reservoir.
High Line Pumping Co.	4,000	2,000	50.0	Twin Falls Canal	Pumping plant.
Houston Ditch Co.	1,800	600	33.3	Big Lost River	
Total	868,300	456,600	52.5		

[1] Original construction company failed before completing storage reservoir. A few settlers are irrigating their holdings from regular stream flow.
[2] Now a Reclamation Service project.

Development under the Carey Act—Continued.

Name of project.	Area in project.	Area irrigated 1917.	Per cent of total area reclaimed.	Source of water supply.	Special features.
Wyoming:	*Acres.*	*Acres.*			
Big Horn Canal Co.	25,500	16,000	62.7	Big Horn River.	
Eden Irrigation & Land Co.	21,300	4,100	19.2	Big Sandy River.	Storage reservoir.
Big Horn Basin Canal & Colonization Co.	21,000	14,000	66.6	Big Horn River.	
Cody Canal Association	20,000	10,000	50.0	Shoshone River.	
La Prele Canal	18,500	8,000	42.7	La Prele Creek	Do.
North Platte Valley Canal & Irrigation Co.	17,800	11,000	61.8	North Platte River.	
Hanover Canal Association.	17,000	5,000	29.4	Big Horn River.	
Shoshone River Canal Co.	17,000	11,000	64.7	Greybull River.	
Uinta County Irrigation Co.	15,000	2,000	13.3	Cottonwood and North Piney Creek.	
James Lake Irrigation Co.	14,500	14,000	95.8	Little Laramie River.	Do.
Wyoming Irrigation Co.	11,800	2,350	19.9	Paint Rock Creek.	Do.
Lake View Canal Co.	11,000	800	7.3	South Fork Shoshone River.	
Wheatland Industrial Co.	10,500	1,400	13.3	Laramie River.	
Lovell Irrigation Co.	10,000	8,000	80.0	Shoshone River.	
Boulder Canal Co.	9,000	1,000	11.1	Boulder Creek.	
East Fork Irrigation Co.	6,000	500	8.3	East Fork River.	
Sussex Irrigation Co.	5,000	5,000	100.0	Pine Creek	
Total	250,400	114,150	41.5		
Montana:					
Valier-Montana Land & Water Co.	140,000	60,000	42.7	Birch Creek	Do.
Billings Land & Irrig. Co.	25,000	17,000	68.0	Yellowstone River.	
Big Timber Project	18,000	5,000	27.7	Sweet Grass Creek.	Do.
Total	183,000	82,000	44.6		
Oregon:					
Central Oregon Irrig. Co.	60,000	20,000	33.3	Deschutes River.	
Tumalo Project (State)	22,000	5,000	22.7	Tumalo Creek	Do.
Total	82,000	25,000	30.4		
Colorado:					
Two Buttes Irrigation & Reservoir Co.	22,000	15,000	68.2		Do.
Grand total	1,405,700	692,750	49.3		

The following is a brief description of the progress made under the Carey Act in each of the States named:

IDAHO.

By far the greater part of the reclamation work under the Carey Act has taken place in the State of Idaho, about three-fourths of the total area reclaimed being located in that State. Large areas of fertile but nonproductive public land adjacent to abundant water supplies made possible the construction of large projects, embracing, in some instances, hundreds of thousands of acres of land, with few complications regarding titles to the land to be served.

Soon after the passage of the act in 1894, one project of about 65,000 acres was inaugurated. From one cause or another, chiefly lack of funds, the work progressed very slowly and was not finally completed until 1909. No more land was segregated for reclamation under the act until 1903, when the Twin Falls Land & Irrigation Co. project, known as the South Side Twin Falls project, embracing 240,000 acres, was begun and rapidly carried forward. The launch-

ing of this great enterprise, and its succesful completion a few years later, gave a tremendous impetus to this class of irrigation enterprises in the State. In the years following from 1904 to 1911, something like 35 additional requests for the segregation of land for reclamation were granted, involving over 2,000,000 acres and an estimated expenditure of about $66,000,000. Actual construction was begun on a large number of these and by 1912 more than $22,000,000 had been expended. The development reached its crest about 1910 or 1911 and ceased almost entirely in 1913, following the failure of a large banking house which was financing several of the principal projects under construction.

A number of the projects proposed were found to have an insufficient water supply and others were unable to secure sufficient capital for their construction, and the lands were consequently restored to entry before the construction stage was reached. A few others were begun but abandoned after considerable construction work had been done. Some of the completed projects were found to contain a larger acreage than could be irrigated with the existing water supply and others had land under the canals which was found to be nonagricultural for one cause or another. As a result of all this the area included in existing projects has been greatly reduced, until it is now estimated to be not over 875,000 acres, of which 677,000 acres were irrigated in 1917.

WYOMING.

Forty-six companies applied for and were granted segregations of land for irrigation purposes under the Carey Act in Wyoming, the area involved being 1,520,000 acres. Of this total, however, over 900,000 acres are included in three large projects on which either no actual construction work has been done or on which the work was discontinued before it had been carried far enough to provide a water supply. The same thing may be said of a number of smaller projects, so that the area included in existing enterprises is probably not much over 250,000 acres. The area irrigated in 1917, as nearly as could be determined, was about 114,000 acres.

Nearly all of the Wyoming projects now in operation are comparatively small, very few exceeding 25,000 acres in extent. This is probably due to the fact that much of the irrigable land in the State is in narrow strips extending along either side of the stream and thus little opportunity is afforded for reclaiming extensive areas under single systems.

Development under the Carey Act in Wyoming has been of a fairly uniform character. The State accepted the terms of the act in 1895 and applications for segregations were filed quite regularly from that time until about 1912, since which time there has been practically no new development.

OREGON.

In Oregon the net result of the efforts that have been made to reclaim land under the provisions of the act up to the present time is probably not over 25,000 acres actually irrigated and not to exceed 125,000 acres of irrigable land included in projects on which any considerable construction work has been done. Ten projects in all have been segregated, but only three of these are now active, one of which is being financed and managed by the State land board, following the failure of the original construction company to provide a dependable water supply.

MONTANA.

Only three Carey Act projects are now active in Montana, covering an area of 183,000 acres, of which 82,000 acres were irrigated in 1917. The largest of these now has approximately 60,000 acres under irrigation. Three other projects, embracing about 68,000 acres, are in the preliminary stages of development, but are inactive.

COLORADO.

Although Colorado accepted the terms of the Carey Act in 1895, the amount of reclamation accomplished is almost negligible. Only one company has succeeded in providing a dependable water supply for its lands, the area irrigated on this project being estimated at 15,000 acres. Four other projects have been segregated, the total area of which is 182,389 acres.

FAILURES AND THEIR CAUSES.

The building of the necessary works and the reclamation of a large acreage of desert land under the provisions of the Carey Act has been a notable achievement, and benefits will accrue to the entire country and the the Western States in particular. Viewed solely from a financial standpoint, however, this type of enterprise has been an almost complete failure. Of the 100 or more Carey Act projects that have been undertaken in the five States under consideration, not more than three or four have returned profits to the men who have financed them. The causes for this condition are many and a number of these will be discussed in the following pages. No attempt has been made to list these in the order of their importance. In most instances it is probable that combinations of two or more causes have been responsible for the failures.

LACK OF THOROUGHNESS IN MAKING PRELIMINARY SURVEYS.

In the boom days of Carey Act development, everyone interested in such enterprises was optimistic regarding their ultimate success and every project which bore any resemblance to feasibility was

given approval by all concerned. If records of stream flow were not available, a few measurements were made and the area of land which could be irrigated was estimated with these meager data as a basis. In one notable instance a project was approved which depended almost entirely on stored water, and records of the stream flow and of the rainfall over the catchment area were very incomplete at the time construction began on the costly dam. The rainfall records from the nearest Weather Bureau station were taken and the run-off into the reservoir estimated. It was believed that the run-off would amount to 458,000 acre-feet annually. Actual measurements made during the first four years after construction work had begun showed an average run-off of 127,160 acre-feet, the run-off in one year being as low as 102,700 acre-feet. Later on, after a large acreage had been placed under irrigation, there was a year of still more scanty water supply and the impounded water was exhausted in the middle of the irrigation season, resulting in serious damage to crops. It is now believed that not more than one-half of the acreage originally included in the project can be irrigated with the available water supply.

Frequently little attention was paid to the adequacy of the water supply and still less to the character of the land to be irrigated. In most of the projects it has been found necessary to eliminate considerable areas which were originally included in the segregations because the land was found, from one cause or another, to be unsuitable for cultivation. Uusually this was not a serious matter, since the agricultural land was more than could be irrigated with the available water supply, but in some cases the failure of the enterprises was due primarily to this cause. One project in Idaho was constructed in the belief that water rights for 20,000 acres could be sold, and the water supply was abundant for this acreage. When the system was constructed and more detailed topographic surveys were made of the land to be irrigated, it was found that not to exceed 12,000 acres of land could be served, the other land under the ditch being too rough to permit of economical irrigation.

UNDERESTIMATION OF THE COST.

In almost every instance the actual cost of constructing the systems has exceeded the original estimates. This has been due in part to inadequate preliminary surveys discussed above, in part to the constant rise in prices of labor and material, and in part to a desire on the part of the promoters to make the project appear attractive to investors. After the project had been thrown open to entry and the price of the water rights fixed in accordance with the estimated cost, it was difficult and usually impossible to increase the price of the water rights sufficiently to cover the increased cost of construction. In one of the

older projects the first proposal submitted stated that the cost would be about $200,000; the second proposal placed the estimate at $350,000. This proposal was accepted and the work performed, but the actual cost when the project was completed was $1,100,000, and even then a great many temporary wooden structures were used which are now being replaced by permanent structures at considerable cost.

LACK OF PROPER STATE AND FEDERAL SUPERVISION.

It was the evident intent of the Federal and State laws relating to the Carey Act that these agencies should supervise carefully the initiation and construction of the projects in order to prevent speculation and unwise development. In an earlier publication of this department [1] it is stated—

> State supervision in the matter of securing segregations, prosecution of construction, and in the settlement and cultivation of the land not only favors the investor and the settler but promotes the public interest as well.

It was natural to infer that such would be the result, and it might have been if the intent of the law had been carried out faithfully. In the practical working of the law during the earlier years of the development, little more than nominal supervision was exercised. The Department of the Interior has always been careful to determine whether an adequate water supply has been provided in a substantial ditch for each legal subdivision before granting patent to the land, and has made exhaustive investigations and withheld patent to lands for several years in some cases while the investigations were being made, but all this takes place after large sums of money have been invested in building the works and after settlers have resided on the land for several years. The time when careful supervision is most needed is in the very inception of the undertaking to determine the available water supply, to estimate accurately the cost, to discover the agricultural character of the land, and to find out the engineering difficulties to be encountered. That such supervision was woefully lacking until quite recently is amply demonstrated by the large number of failures or partial failures which could have been averted if State officials had made careful surveys and investigations to determine the feasibility of the projects before authorizing their construction.

A radical change has taken place in recent years in the attitude of State officials to the Carey Act companies, and new projects are not now approved until after very careful surveys have been made by the State engineers, and the progress of the work is watched from its inception until the projects are turned over to the settler. There is little danger of failure of projects in future due to lack of State

[1] Irrigation under the Carey Act. Reprint from Ann. Rept. of O. E. S. for the year ending June 30, 1910.

supervision. Attention is called to the matter here because of the important bearing it has had on past failures.

SLOW RATE OF SETTLEMENT.

The success of every irrigation enterprise obviously depends upon the settlement and cultivation of the land by farmers. The eagerness with which men flocked to the opening of new projects led promoters to believe that the land would be settled up as fast as the water was brought to it. While it was recognized that many of the men who drew land at these openings were speculators and would not become bona fide residents, yet it was believed that as fast as these speculators disposed of their holdings they would be bought by real farmers. Such might have been the result if everything had gone smoothly from the start; but this was seldom true. Breaks frequently occurred in the new canals at critical periods, causing damage to crops; excessive transmission losses in the canals and laterals made it impossible for the canal companies to deliver sufficient water to the farmers, which resulted in friction and misunderstanding between the company and the settlers; the yields on the new lands were disappointing; and other things conspired to make the new settlers discouraged and willing to sell out at a loss. This made it very difficult for the speculators to sell their holdings and frightened away prospective settlers. Consequently, instead of settlers coming to the projects in large numbers, it became necessary for the companies to go throughout the country in search of settlers, and this has added very materially to the cost of the enterprises.

Not only this, but slowness of settlement also meant meager revenue to the construction company for years after the works had been completed and large sums of money expended. While in theory every entryman, whether a resident or not, is required to make his payments regularly, and, if he fails, foreclosure proceedings may be instituted against him, as a matter of fact this has never been done during the initial stages of any Carey Act project, chiefly because of the large number of entrymen who were delinquent and the adverse advertising such proceedings would give the enterprise.

ALLOWING SETTLERS TO MAKE THEIR HOMES ON THE LAND BEFORE THE COMPLETION OF THE PROJECT.

When an irrigation project is nearing completion, great pressure usually is brought to bear on the construction company by the entrymen to throw the land open to settlement. There is also a desire on the part of the company to begin delivery of water at the earliest possible moment, since payments on the water contracts begin when water is delivered to the land, provided it is at the beginning of the irrigation season. As a result of this, settlers have been notified that

water would be ready for delivery on a certain date, and have moved to the tract with their families only to find that the company could not make a satisfactory delivery of water, resulting in crop failures. Such a condition created dissatisfaction among the settlers and distrust of the irrigation company which required years to overcome, causing delay in settlement and consequent loss of revenue, as already pointed out.

IGNORANCE ON THE PART OF PROSPECTIVE SETTLERS OF DIFFICULTIES TO BE OVERCOME IN RECLAIMING DESERT LAND.

There has usually been a tendency on the part of irrigation companies and land agents to paint in glowing colors the advantages of irrigation farming, and to minimize the difficulties and hardships. Since a large part of the people drawn to these new projects came from localities where irrigation is not practiced, they depended quite largely on the printed "literature" sent them and upon the statements of land agents. Consequently, they believed that with the magic of irrigation their desert holdings would be transformed in a few short months into highly productive farms. They came to the land with only sufficient money to build the necessary temporary improvements, purchase a few head of live stock and the most essential pieces of farm equipment, and make the initial payments on their contracts. Had they known beforehand that an irrigated farm seldom produces remunerative crops the first year, that it usually requires two or more years to get the entire farm cleared, properly leveled and ditched, and that they should have, at the start, sufficient resources available to tide them over these lean years, there would not have been such a large number of abandoned farms and so many dissatisfied farmers on the new irrigation projects of the West. Had such facts been more generally known, settlement the first two or three years undoubtedly would have been slower; but if the first farms had been developed by men fully aware of the task ahead of them and possessing the necessary means to carry it forward, settlement would have proceeded steadily and at a constantly increasing rate as the number of prosperous farms multiplied, instead of suffering a setback, as has so frequently been the case.

REQUIREMENT THAT WATER RIGHTS BE PAID FOR IN 10 YEARS OR LESS.

In nearly all the original contracts between the settlers and the companies it was required that payments on the water rights be made in 10 annual installments, with interest on deferred payments at 6 per cent. Owing to conditions described in the preceding paragraph, few settlers found themselves able to make the annual payments as they became due. This, of course, resulted in great loss of revenue to the companies and forced many of them into bankruptcy.

This defective provision has been remedied by most of the companies by supplemental contracts granting an extension of time for making payments. The contract which now seems to be favored most provides that interest only be paid for the first five years after the initial payment and that the remaining payments on the principal be made in from 10 to 15 annual installments, beginning the sixth year. These annual payments are usually on a graduated scale, the first payment being the smallest and the last the largest. While it is true that such a plan results in small revenues to the construction company during the early stages of the enterprise, just as has been true under the old contracts due to failure to meet the payments when due, yet it is believed that it is a more dependable plan and more attractive to investors.

FUTURE POSSIBILITIES.

There seems to be every reason to believe that the completed or partially completed Carey Act projects will, with few exceptions, eventually be completely cultivated under one form of organization or another. Some have already been organized into irrigation districts and have sold bonds to complete and improve their systems. In one case a project which had failed was taken over by the State, operated under the management of the State land board for two or three years, and finally taken over by the Reclamation Service, which intends to replace the temporary wooden structures with permanent structures and put the system in good shape. As has already been pointed out, one project in Oregon has been taken over by the State land board, to be operated until the settlers are able to take control of the system.

The question to be considered under this heading relates principally to new undertakings. Is it safe for private capital to invest in undertakings of this sort in view of the fact that so few of them have been successful? A study of the causes of the failures which have occurred reveals the fact that they apply to irrigation enterprises of every sort and not to Carey Act projects alone. There is nothing fundamentally wrong with the Carey Act. It still provides the best method for reclaiming public land in the West where the undertaking is too great for individual or cooperative effort and where it is not possible or advisable for the projects to be built by the Federal Government. In States where a large part of the land susceptible of irrigation has already passed into private ownership the Carey Act is not adaptable, but where the land is truly desert in character this condition seldom exists.

Before private capital again can be induced to invest large sums in Carey Act enterprises, every effort must be made to safeguard against losses. It is believed that this can be done best by following

the course outlined below. Some slight changes in existing laws may be necessary to permit the adoption of these suggestions.

1. Careful preliminary investigations should be conducted by the promoters in cooperation with the State to determine the water supply, the soil conditions, and the topography of the land to be irrigated, the probable cost, etc. All lands which can not be reclaimed at reasonable cost—i. e., rocky, rough, gravelly, etc.—should be eliminated at the outset.

2. Settlement of the tract should be in units, such settlement not being permitted until the portion of the system to serve the land in the unit has been completed and thoroughly tested.

3. A long time should be allowed the settlers to make payments on their contracts, only the initial payment and annual interest being required for the first five years.

4. Only settlers with sufficient experience in farming and sufficient capital to make success on their part reasonably sure should be accepted.

5. The entire area in each holding should be put into cultivation within a reasonable time, and a penalty should be provided for failure to do this—in other words, the speculator should be eliminated.

6. Expert assistance should be afforded new settlers in clearing, leveling, and ditching their farms.

7. The States should provide some means for making the cost of construction a lien on the lands. The Federal law permits this but the States have not provided for it. Heretofore, bonds issued by Carey Act companies have been secured by notes given by settlers to secure deferred payments. The settlers had no title to the land and the notes were liens only on the settlers' equity in these lands, and when settlers defaulted the security became almost worthless. It is very doubtful whether any more bonds can be sold without the adoption of the suggested provision.

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